

# Simulated ToF

*Marcin Wolter*

GEANT Monte Carlo files used.

# Monte Carlo files used

- ◆ Full GEANT MC, about 14 000 events generated April 2002 – „*simple*” ToF model.
- ◆ MC generated with two different types of tracks: MITMC and PROD tracks.

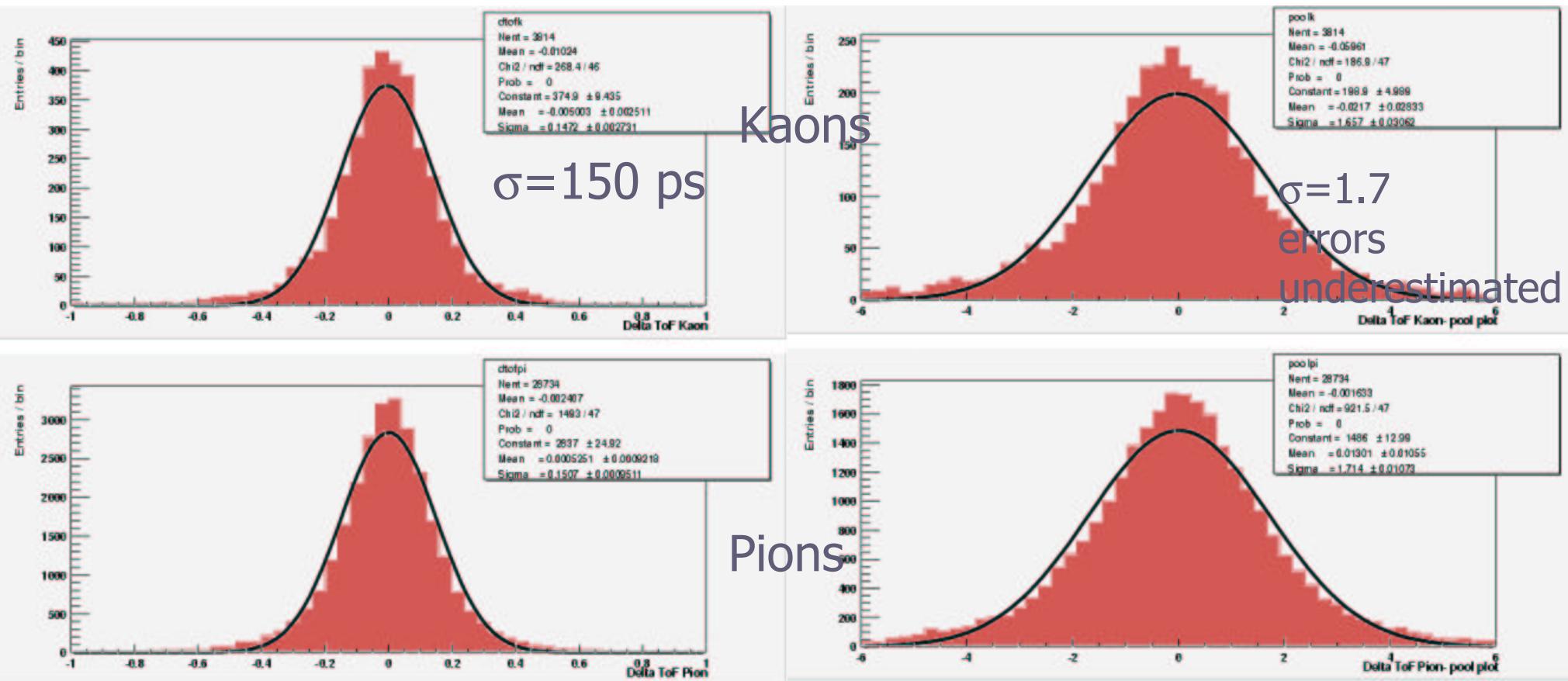
# Technicalities

- ◆ **CDF software release 4.8.4**
- ◆ **Data objects used:**  
TOFD
- ◆ **Reconstruction performed once more:**  
TOFD->TofPulsesColl ->  
TofMatchesColl

**Reconstruction TofModule (tcl file):**

```
module enable TofModule
module talk TofModule
ReconMenu
Pulses set Simple
Pulses_useTOFDCuts set true
Pulses_minAdcCut set 0
Pulses_minTdcCut set 0
Extrapolator set Geometric
Geometric_overrideProcName set true
Geometric_procName      set MITMC
Associator set TLR
TZero    set NegLog
exit
CalibratorType set Dummy
exit
```

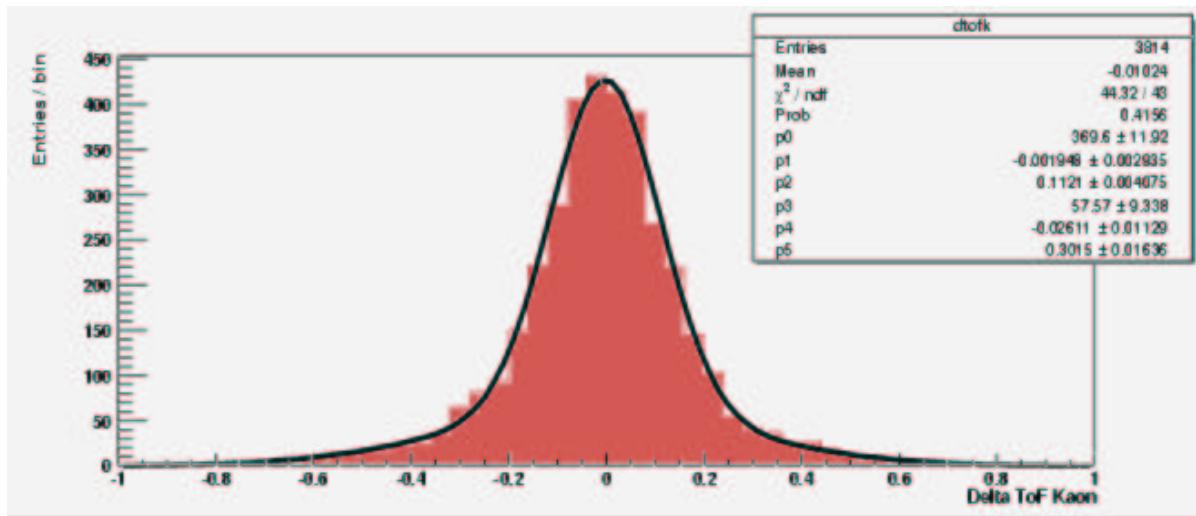
# Simulated ToF



Simulated ToF - true ToF  
Gaussian + tails

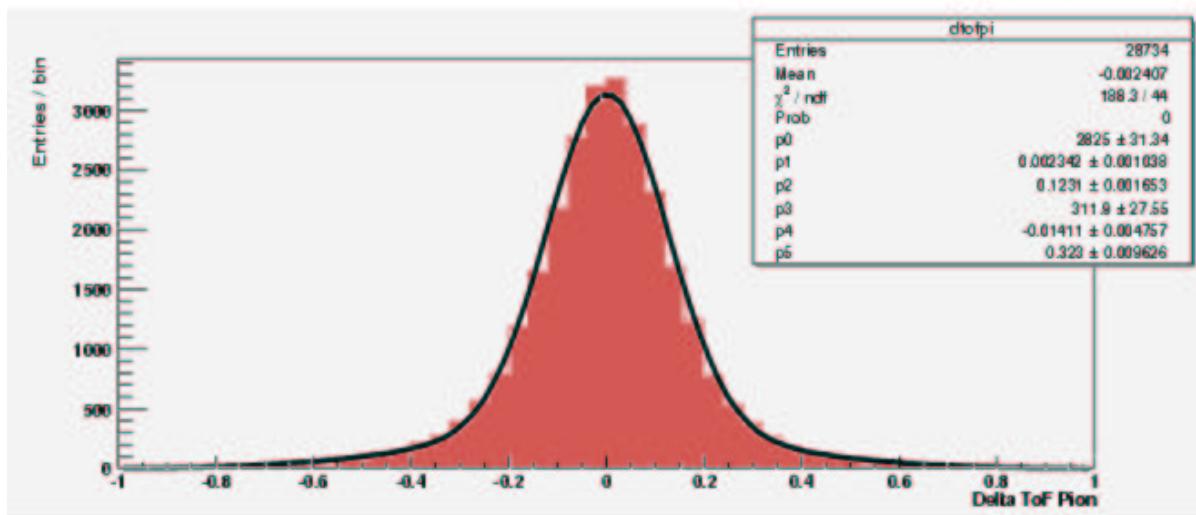
Pool-plot

# Simulated ToF – fit with two Gaussians



Kaons

$$\sigma_1 = 112 \text{ ps}$$
$$\sigma_2 = 301 \text{ ps}$$

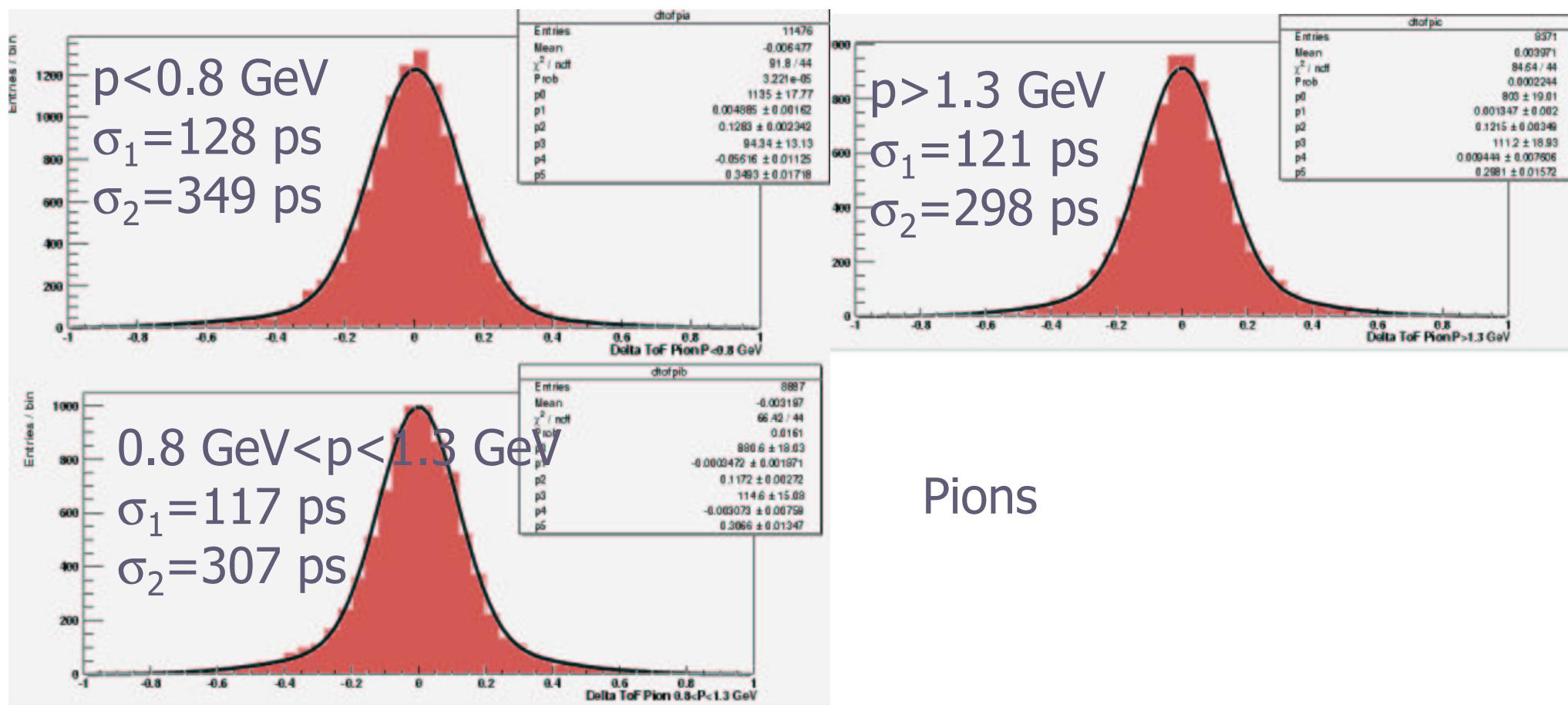


Pions

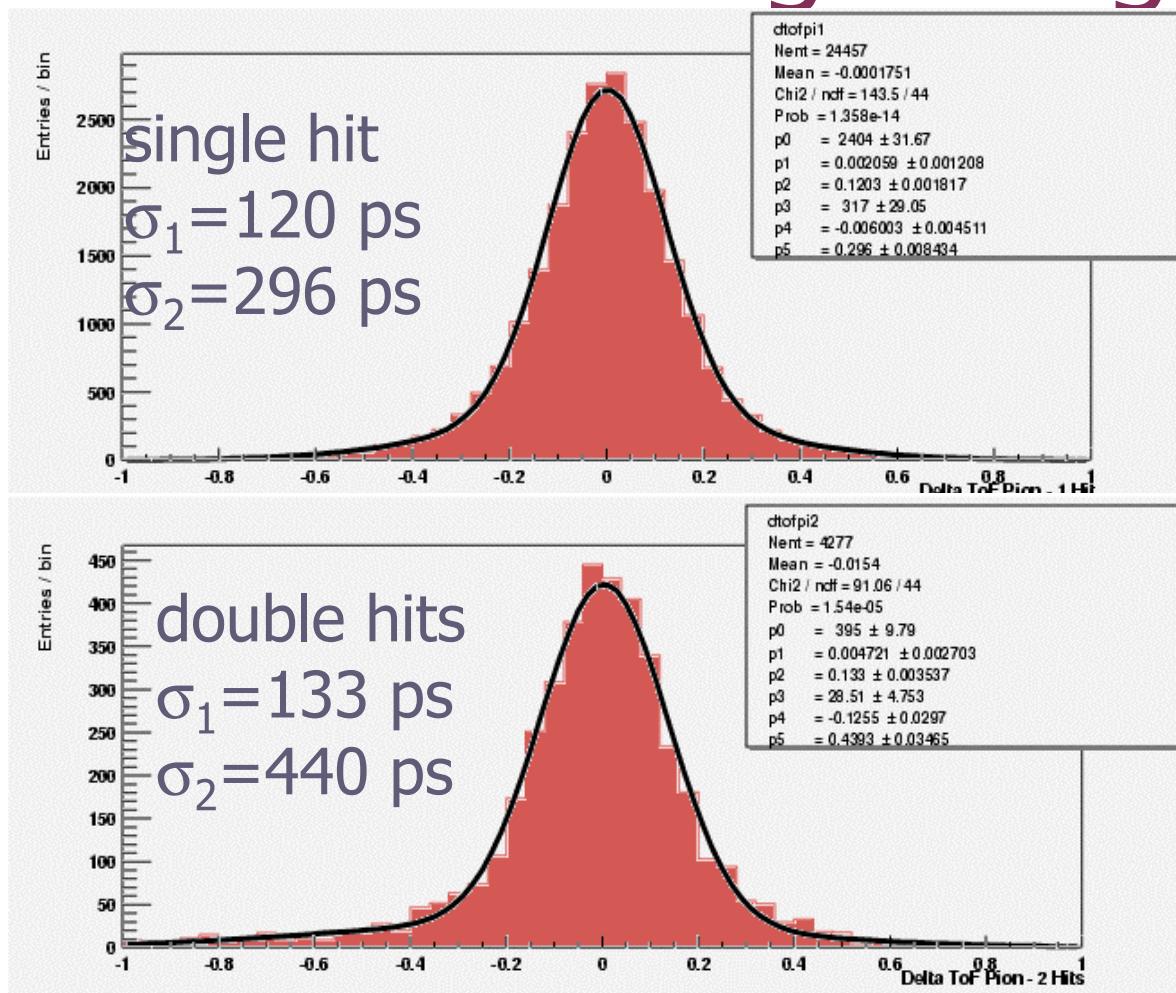
$$\sigma_1 = 123 \text{ ps}$$
$$\sigma_2 = 323 \text{ ps}$$

Simulated ToF - true ToF  
Gaussian + tails  
Fit –<sup>5</sup>two Gaussians

# ToF resolution does not (strongly?) depend on particle momentum

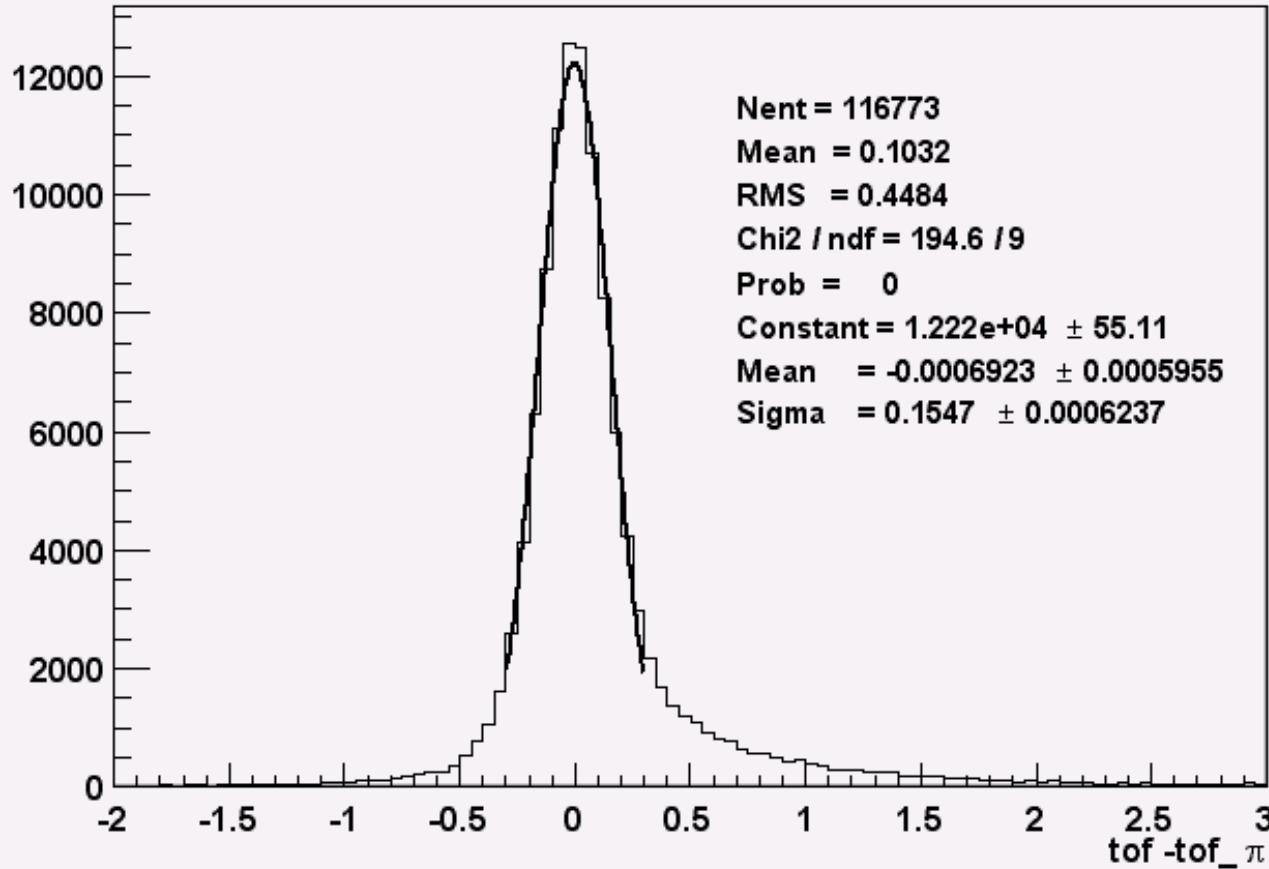


# More tracks hitting a single bar



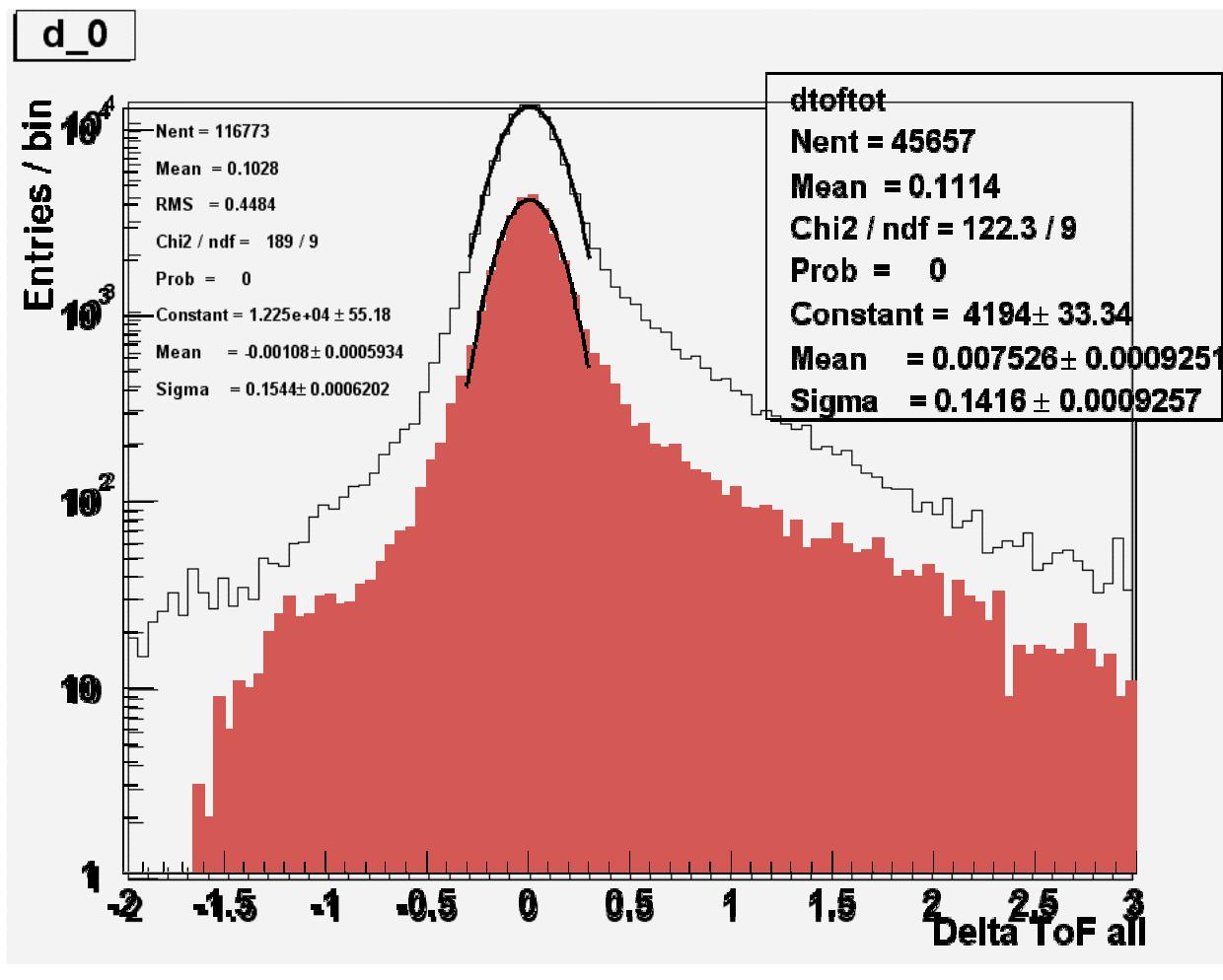
# ToF resolution in RunII data

tof-tof\_π ns (all bars included)



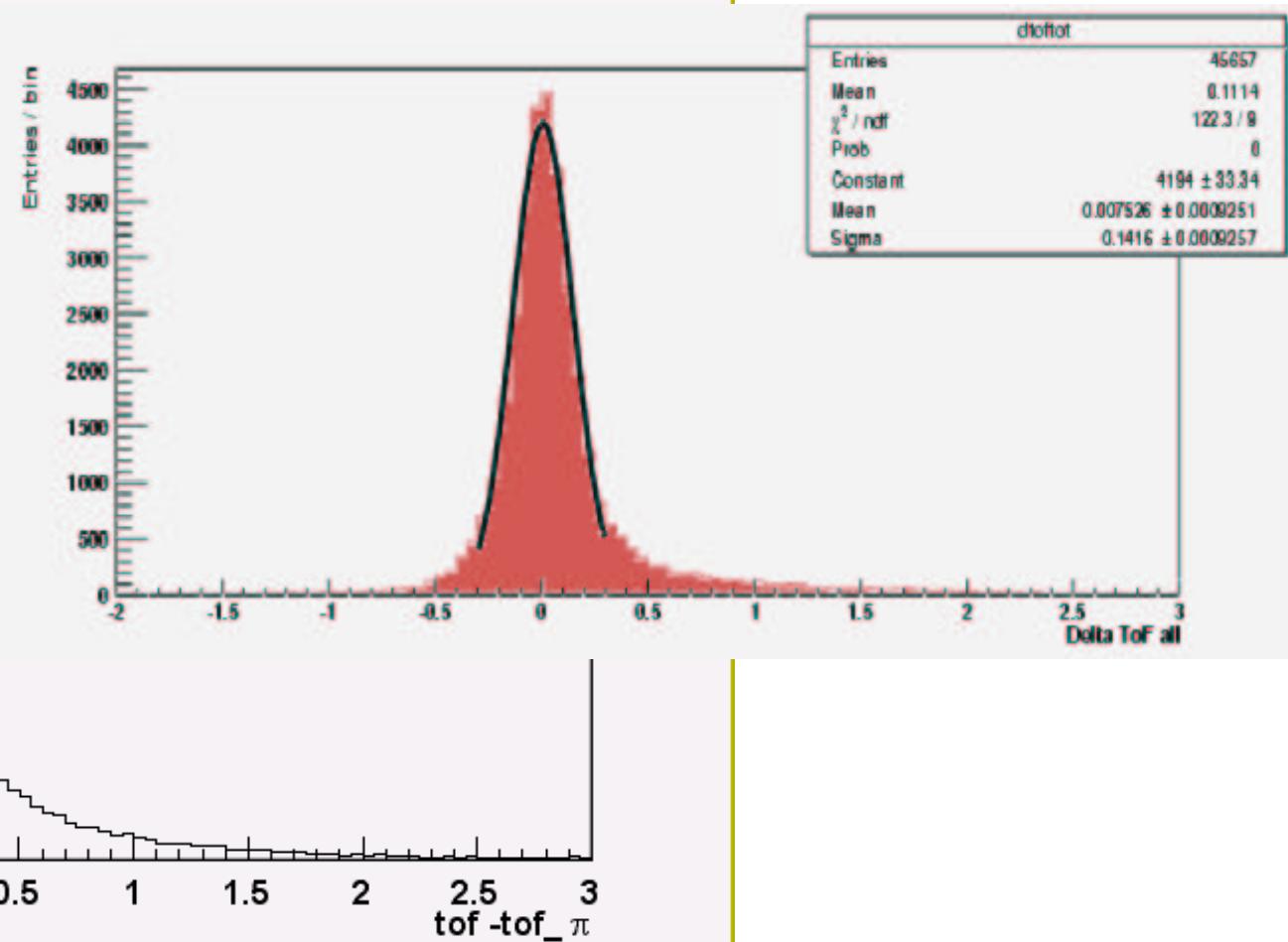
- ◆ ToF-ToF(Pion)
- ◆ Long tail – Kaons and other heavier particles.
- ◆ Resolution integrated over all PMT's and over the scintillator length.
- ◆ Similar resolution as in MC.

# Simulated and real ToF resolution



# Simulated and real ToF resolution

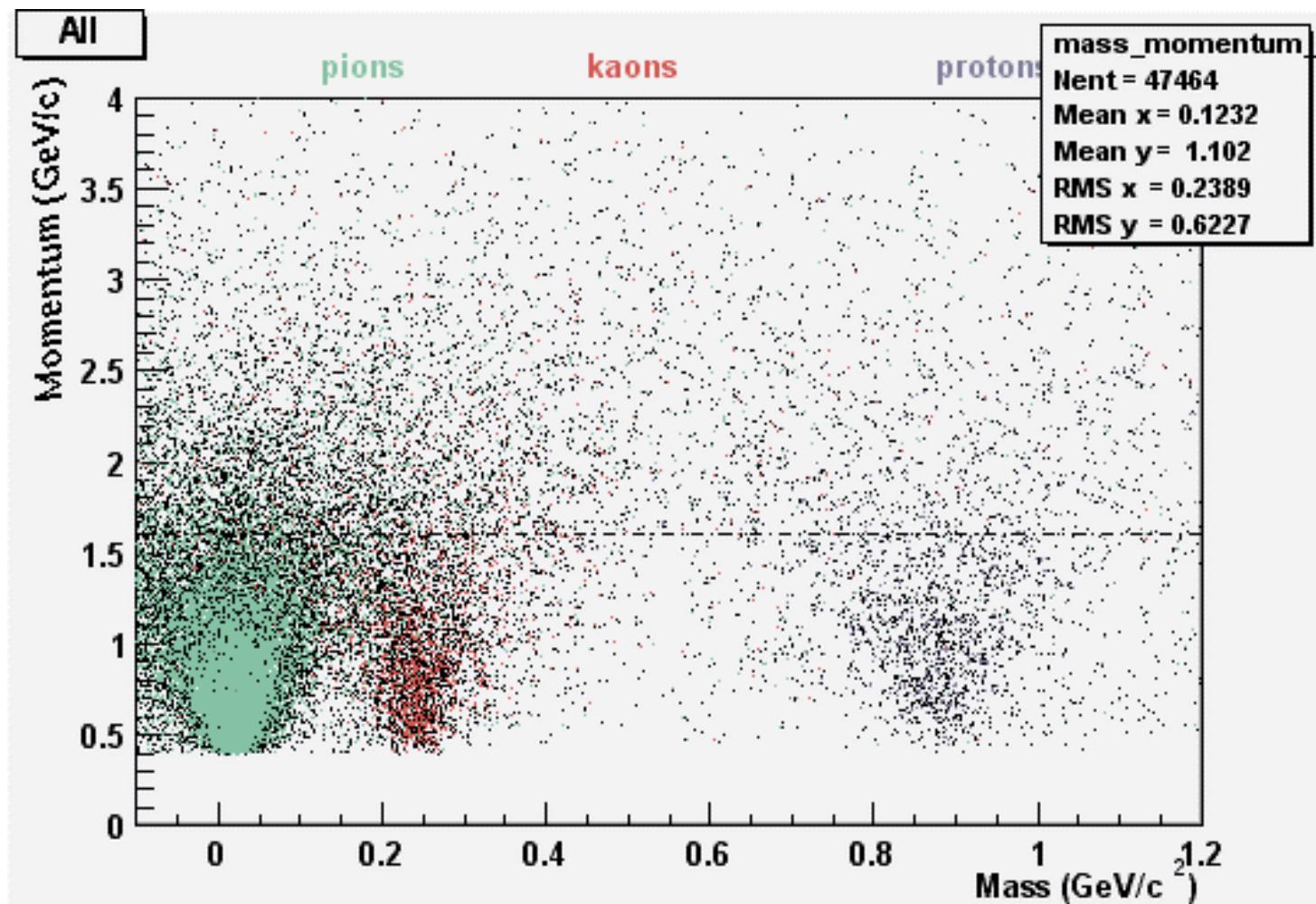
tof-tof\_π ns (all bars included)



# Summary

- ◆ Simulated ToF resolution similar to the measured one.
- ◆ ToF resolution is not Gaussian.

# Squared mass



# Code

```
TofMatchesColl_ch matches;  
TofMatchesColl  ::find(matches);
```

```
TofMatchesColl::TrackToTofMap map;  
map = matches->getTrackToTofMap(*tracks);  
.....  
_ToF_tof[i]      = map[&**itrack]->getTof();
```